Fig. 1

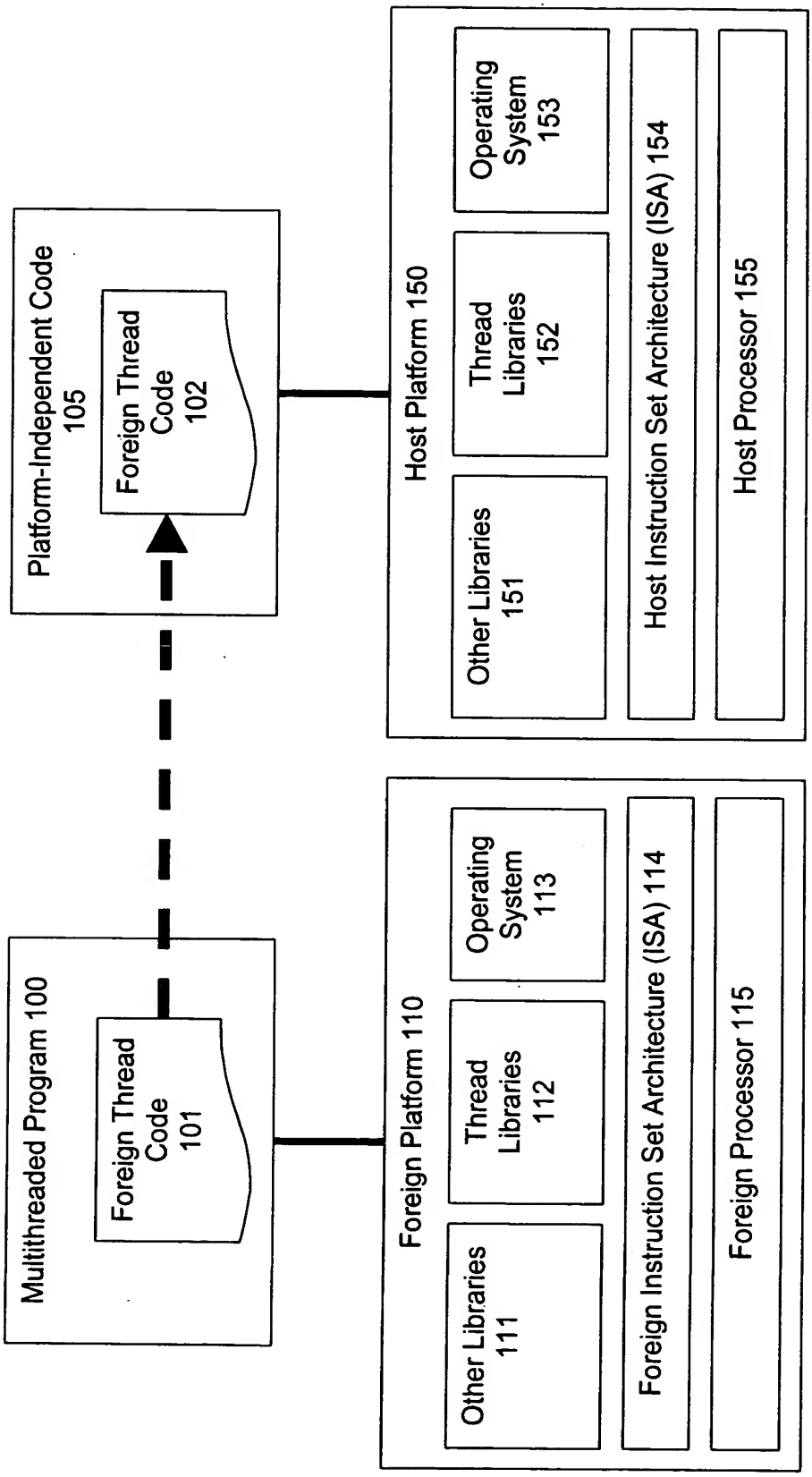
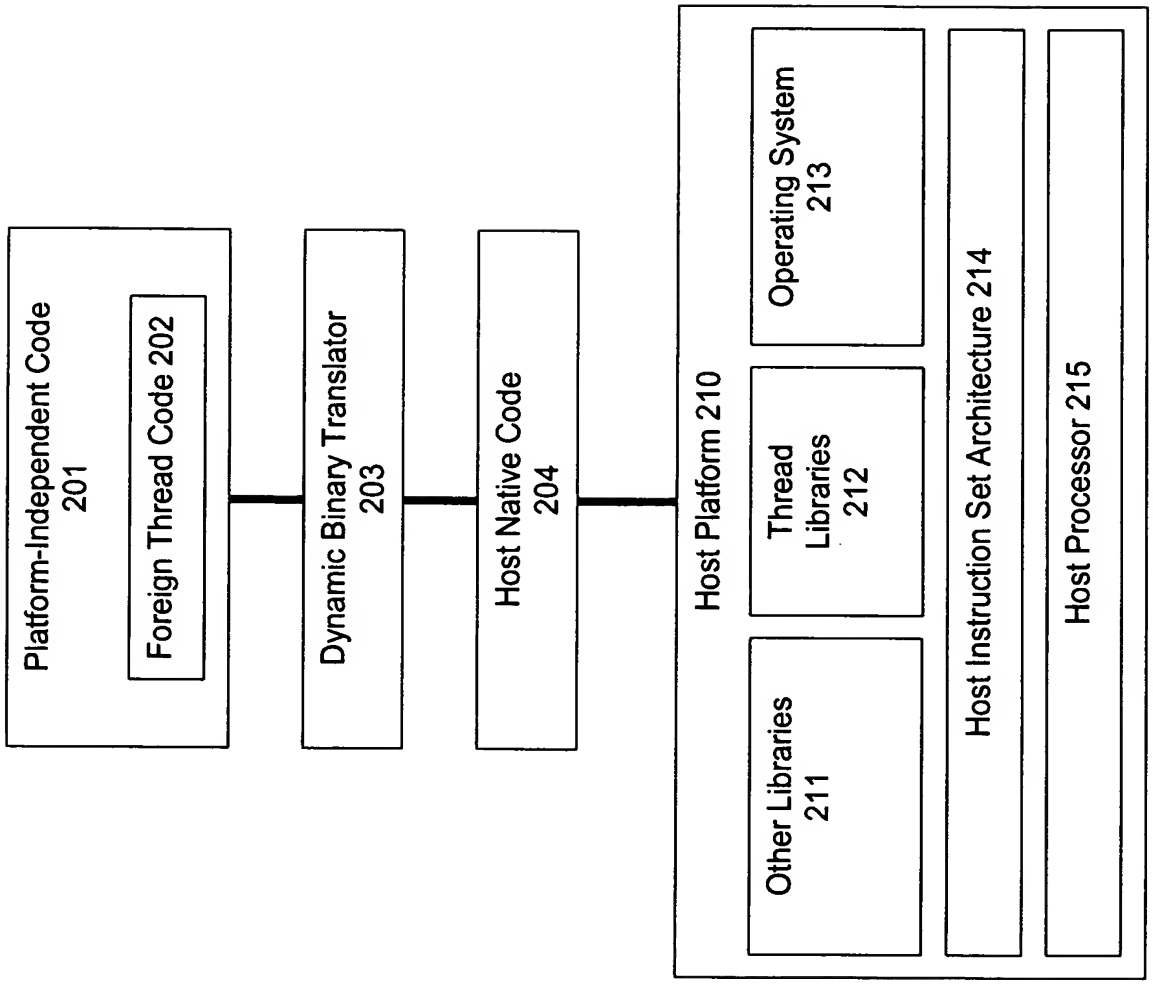

Multithreaded Program 100
Foreign Thread Code 101
Platform-Independent Code 105
Foreign Thread Code 102
Foreign Platform 110
Other Libraries 111
Thread Libraries 112
Operating System 113
Foreign Instruction Set Architecture (ISA) 114
Foreign Processor 115
Host Platform 150
Other Libraries 151
Thread Libraries 152
Operating System 153
Host Instruction Set Architecture (ISA) 154
Host Processor 155

Fig. 2


Platform-Independent Code
201
Foreign Thread Code 202
Dynamic Binary Translator
203
Host Native Code
204
Host Platform 210
Other Libraries
211
Thread
Libraries
212
Operating System
213
Host Instruction Set Architecture 214
Host Processor 215

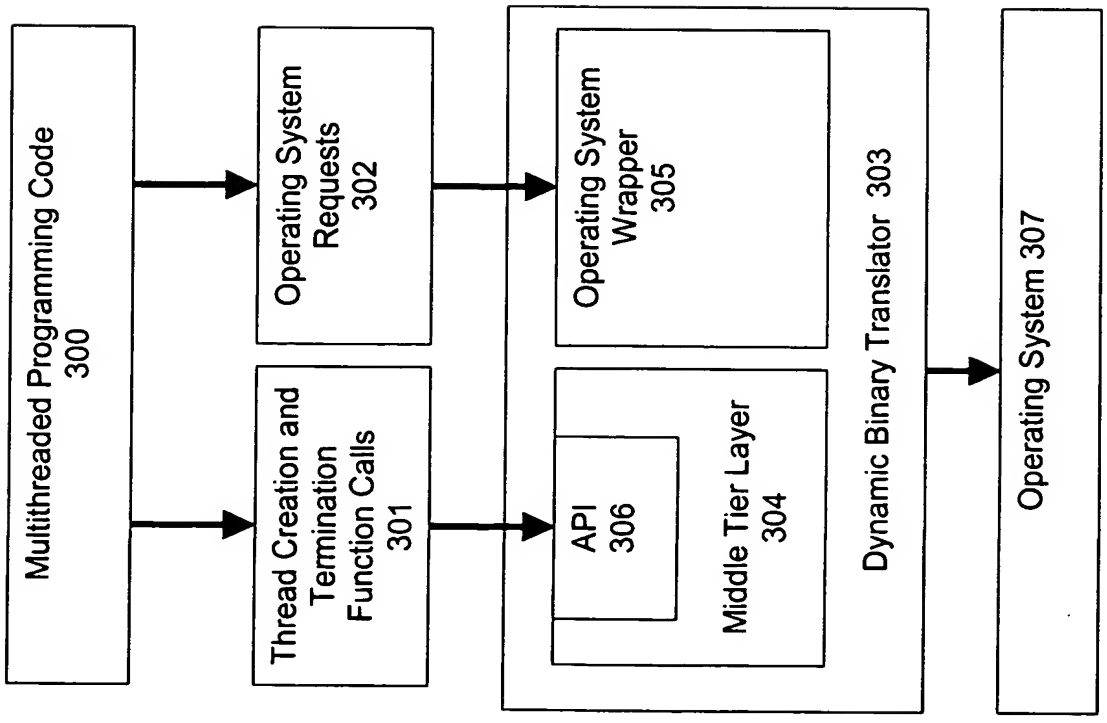

Multithreaded Programming Code
300
Thread Creation and Termination Function Calls
301
Operating System Requests
302
Dynamic Binary Translator 303
Operating System Wrapper
305
API
306
Middle Tier Layer
304
Operating System 307

Fig. 3

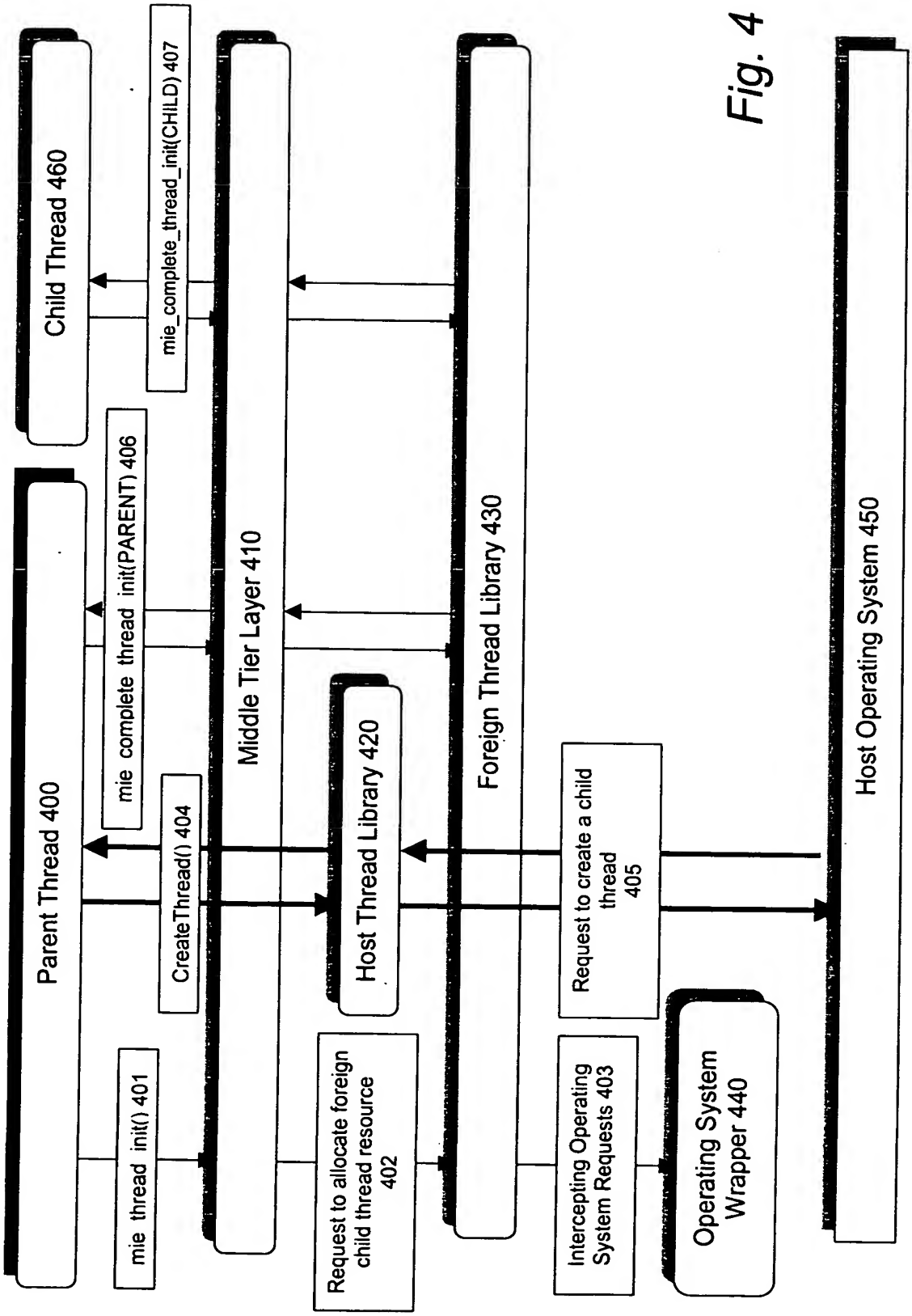

Host Environment 490
Parent Thread 400
Child Thread 460
mie thread init() 401
mie complete thread init(PARENT) 406
mie_complete_thread_init(CHILD) 407
CreateThread() 404
Middle Tier Layer 410
Request to allocate foreign child thread resource 402
Host Thread Library 420
Foreign Thread Library 430
Request to create a child thread 405
Intercepting Operating System Requests 403
Operating System Wrapper 440
Host Operating System 450

Fig. 4

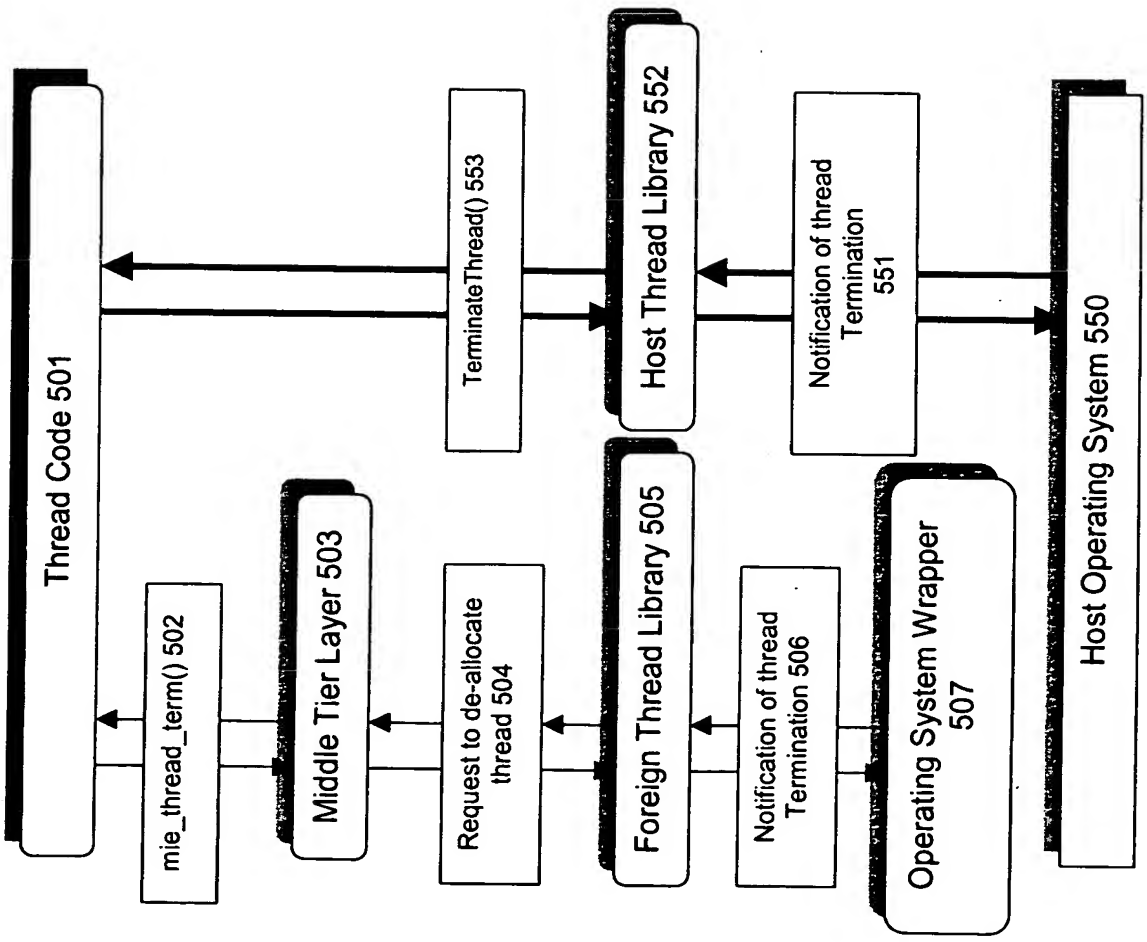

Thread Code 501
mie_thread_term() 502
Middle Tier Layer 503
Request to de-allocate thread 504
Foreign Thread Library 505
Notification of thread Termination 506
Operating System Wrapper 507
Host Operating System 550
TerminateThread() 553
Host Thread Library 552
Notification of thread Termination 551

Fig.5

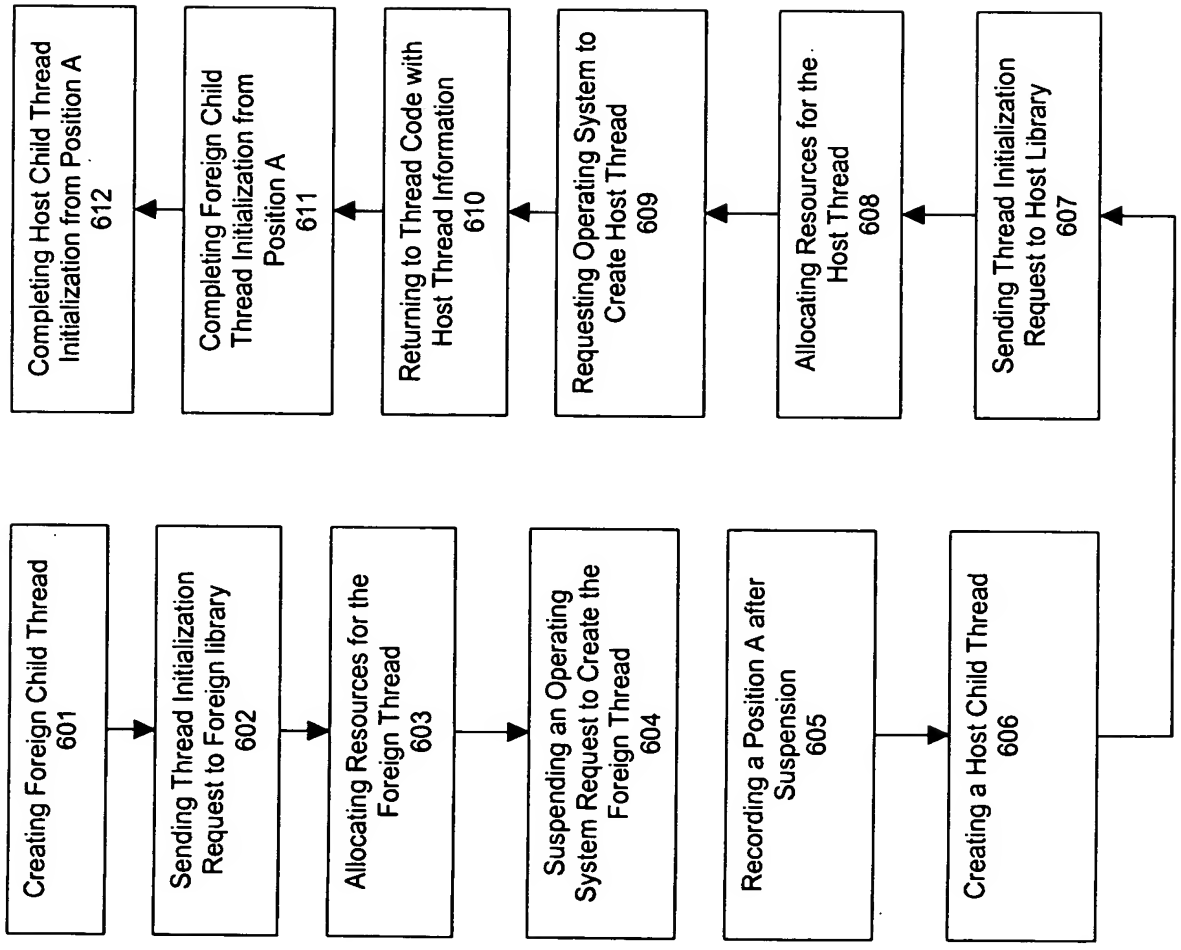

Creating Foreign Child Thread 601
Sending Thread Initialization Request to Foreign library 602
Allocating Resources for the Foreign Thread 603
Suspending an Operating System Request to Create the Foreign Thread 604
Recording a Position A after Suspension 605
Creating a Host Child Thread 606
Sending Thread Initialization Request to Host Library 607
Allocating Resources for the Host Thread 608
Requesting Operating System to Create Host Thread 609
Returning to Thread Code with Host Thread Information 610
Completing Foreign Child Thread Initialization from Position A 611
Completing Host Child Thread Initialization from Position A 612

Fig. 6